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(2015)

What aspects of demographic, personality, attitudes, and perceptions of law enforcement influence self-reported likelihood of drink driving?
Journal of Risk Research, 18(9), pp. 1203-1219.

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The Version of Record of this manuscript has been published and is available in *Journal of Risk Research*, 12 June 2014, <http://www.tandfonline.com/10.1080/13669877.2014.923026>

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<http://doi.org/10.1080/13669877.2014.923026>

What Aspects of Demographic, Personality, Attitudes, and Perceptions of Law Enforcement Influence Self-reported Likelihood of Drink Driving?

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Abstract

The aim of the current study was to examine the associations between a number of individual factors (demographic factors (age and gender), personality factors, risk-taking propensity, attitudes towards drink driving, and perceived legitimacy of drink driving enforcement) and how they influence the self-reported likelihood of drink driving. The second aim of this study was to examine the potential of attitudes mediating the relationship between risk-taking and self-reported likelihood of drink driving. In total, 293 Queensland drivers volunteered to participate in an online survey that assessed their self-reported likelihood to drink drive in the next month, demographics, traffic-related demographics, personality factors, risk-taking propensity, attitudes towards drink driving, and perceived legitimacy of drink driving enforcement. An ordered logistic regression analysis was utilised to evaluate the first aim of the study; at the first step the demographic variables were entered; at step two the personality and risk-taking were entered; at the third step, the attitudes and perceptions of legitimacy variables were entered. Being a younger driver and having a high risk-taking propensity were related to self-reported likelihood of drink driving. However, when the attitudes variable was entered, these individual factors were no longer significant; with attitudes being the most important predictor of self-reported drink driving likelihood. A significant mediation model was found with the second aim of the study, such that attitudes mediated the relationship between risk-taking and self-reported likelihood of drink driving. Considerable effort and resources are utilised by traffic authorities to reducing drink driving on the Australian road network. Notwithstanding these efforts, some participants still had some positive attitudes towards drink driving and reported that they were likely to drink drive in the future. These findings suggest that more work is needed to address attitudes regarding the dangerousness of drink driving.

Keywords: Drink driving; demographics; attitudes; perceived legitimacy; personality; risk-taking; Australian Drivers

What Aspects of Demographic, Personality, Attitudes, and Perceptions of Law Enforcement Influence Self-reported Likelihood of Drink Driving?

In Australia, drivers who hold an open (i.e., unrestricted) licence can drive legally if their blood alcohol concentration (BAC) is below 0.05% (which is 50mg of alcohol per 100ml of blood). The legal BAC limit for drivers who hold various other licence types (e.g. learner, provisional, restricted and professional drivers) can range from 0.00 to 0.02 depending on which jurisdiction they are driving in. In the Australian state of Queensland during 2010, 269 fatalities occurred on the states road network with excessive BAC levels being identified as the contributing factor for approximately a fifth (22.10%) of these crashes (Transport and Main Roads 2012).

Substantial reductions of the prevalence rates of drink driving have occurred over a number of years. These reductions have been accomplished from a combination of enforcement practises and educational campaigns (Homel 1988). Notwithstanding the previous successes of reducing incidence of drink driving, drivers with mid- to high-level BAC levels ($> 0.1\%$) still account for the majority of fatal drink driving crashes (Wagenaar, Maldonado-Molina et al. 2007, Transport and Main Roads 2012) with many individuals reporting drinking and driving without being apprehended (Homel 1988, Freeman and Watson 2009). A number of studies have examined how legal factors (i.e., deterrence theory) are associated with drink driving. However, less research has been conducted that has examined the effects of several individual factors (attitudes, personality, etc) influence drink driving likelihood, particularly at the multivariate level. As such, examining factors that could influence an individual to drink drive remains a critical aspect for continuing the reductions of drink driving fatalities.

Several demographic factors have consistently been associated with greater likelihood of drink driving. Young drivers have been reported to be overrepresented in road crash

statistics, including alcohol-related crashes (Transport and Main Roads 2012). Previous research has stated that young drivers are more likely to drink driving when compared to older drivers (Doherty, Andrey et al. 1998). Males are reported to be involved in more drink driving crashes (Transport and Main Roads 2012) and are twice as likely to drink drive as women (Shults, Kresnow et al. 2009). Considered together, younger drivers and males are more likely to drink drive than females.

Attitudes surrounding the acceptability of drink driving is likely to be a salient factor for performing the behaviour. That is, more favourable attitudes towards drink driving could potentially lead to greater likelihood of drink driving. Despite the extant literature that demonstrates the effectiveness of legal sanctions for deterring drink driving (e.g., Homel 1988), positive attitudes towards drink driving are more of an influential predictor for self-reported drink driving, over and above the legal and non-legal deterrents (Freeman and Watson 2009). Convicted drink drivers report more lenient attitudes towards drink driving (Baum 2000). Previous work by Davey, Davey et al. (2005) suggest that positive attitudes for drinking and driving are associated with greater likelihood of performing this behaviour with a sample of university students. However, the attitudes (or perceptions) towards law enforcement practises were also relevant as an influencer for drink driving.

A small but growing amount of literature is highlighting the influence that perceptions of legitimacy of law enforcement practises can have on individuals engaging in an illegal behaviour (McKenna 2007, Watling and Leal 2012). Previous work has shown at the bivariate level, that higher perceptions of legitimacy of drink driving enforcement has been related to lower likelihood of drink driving (Watling and Leal 2012). Additionally, more positive attitudes towards enforcement practises have been related to lower likelihood of drink driving (Politis, Basbas et al. 2013). However, multivariate analyses are lacking that specifically examine perceptions of legitimacy. An encouraging aspect of perceived

legitimacy for traffic authorities is that an individual's perceptions of legitimacy can be modified and this results in a lower likelihood of engaging in the illegal driving behaviour (McKenna 2007), representing a potential target for intervention.

Personality constructs have also been shown to have an association with drink driving likelihood. Specifically, Patil, Shope et al. (2006) have reported that a number of personality traits (i.e., physical/verbal hostility, general aggression, and tolerance of deviance) are associated with drink driving. Other studies examining the association between personality facets and drink driving have found sensation seeking, impulsiveness, assertiveness, psychopathic deviance, and driver anger to be related with drink driving likelihood (McMillen, Adams et al. 1992, Nolan, Johnson et al. 1994, Fernandes, Job et al. 2007, Fernandes, Hatfield et al. 2010). While these studies have demonstrated significant associations between facets of personality and drink driving likelihood, the sheer myriad of personality facets makes comparisons between studies difficult and complicated.

A potential solution for this would be to utilise a personality taxonomy that has been widely accepted, has traits that do not overlap, and is able to reasonably encapsulate personality structure. The Big Five personality model which includes the constructs of extraversion, conscientiousness, agreeableness, openness, and neuroticism, provides a reasonably complete taxonomy of personality structure (Goldberg 1992). The utility of the Big Five model has been demonstrated by a meta-analysis study that found conscientiousness and agreeableness were associated with vehicle crashes (Clarke and Robertson 2005) and extraversion as well as conscientiousness associated with alcohol use and binge drinking (Raynor and Levine 2009). While Hubicka, Källmén et al. (2010) has examined how the factors of the Big Five personality model vary between offender and non-offender samples, to date there is scant research that has specifically examined how the Big Five model of personality is associated with drink driving likelihood.

The individual factor of risk-taking may also influence the likelihood of drink driving. For instance, several studies have found risk-taking propensity to be associated with drink driving likelihood (Horvath and Zuckerman 1993, Patil, Shope et al. 2006). Many studies have used general measures of risk-taking which assess risk-taking in several situations. However, risk-taking propensity is not consistent across different situations and has high levels of within subject variability across differing situations (Horvath and Zuckerman 1993, Deck, Lee et al. 2013). Moreover, it has been suggested that some risk-taking measures assess personality traits which are then used inferred as risk-taking propensity and as stated earlier, risk-taking is likely to be situational dependant (Harrison, Young et al. 2005). Risk-taking measures that are more aligned to the behaviour of interest provide a more specific evaluation of risk-taking propensity for that particular behaviour (Weber, Blais et al. 2002, Harrison, Young et al. 2005). As such, a risk-taking measure that is specific to the behaviour of driving could provide unambiguous relationships between risk-taking propensity and drink driving.

A potentially influential consequence for increased likelihood of drink driving could be the relationship between risk-taking and attitudes. Several studies have shown that attitudes towards drink driving are quite influential regarding the likelihood of drink driving (Turrisi, Jaccard et al. 1997, Sarma, Carey et al. 2013). For instance, Freeman and Watson (2009) study of drink driving deterrents found attitudes towards drink driving was an important predictor of self-reported drink driving. Moreover, the attitude towards drink driving variable was also associated with perceptions of risk of crashing and both variables were predictive of self-reported drink driving. A number of studies have found risk-taking propensity is also associated with drink driving (Horvath and Zuckerman 1993, Patil, Shope et al. 2006). Studies that examined the attitudes towards road safety and risk-taking

propensity have found prominent associations of both variables with several risky driving behaviours (Iversen 2004, Sarma, Carey et al. 2013).

These studies suggest that risk-taking and attitudes could be quite influential for the likelihood of drink driving. However, the way to these two variables are associated with each other and with drink driving behaviour have not been previously examined. Given the situational dependant nature of risk-taking propensity (e.g., Horvath and Zuckerman 1993, Deck, Lee et al. 2013) and the consistent relationship of attitudes with risk-taking, it is possible that attitudes might be an intervening factor for drink driving behaviours. Ulleberg and Rundmo (2003) have demonstrated that the relationships between risk perception as well as personality traits with risky driving behaviours are mediated by attitudes. Yet, the outcome variable used by Ulleberg and Rundmo (2003) did not measures any aspect of drink driving, and was primarily concerned with the risky driving behaviour of speeding. Therefore, the potential of a mediating effect that attitudes might have on risk-taking and drink driving likelihood should be examined to confirm if the risk-taking and attitudes relationship are important for the facilitation of drink driving behaviour.

The Current Study

Identifying individual factors that influence drink driving likelihood and enhancing our understanding of how these individual factors are related to drink driving likelihood remains an important undertaking. The cited literature suggests that a number of individual factors could influence the likelihood of drink driving. However, scant research has been conducted that examines the associations of the individual factors of demographics (age and gender), personality factors, risk-taking propensity, attitudes towards drink driving, and perceived legitimacy of drink driving enforcement and how they influence the self-reported likelihood of drink driving in a multivariate analysis. While the previously reviewed literature demonstrates the associations between these individual factors and drink driving, the relative

importance of each of these individual factors cannot be inferred without direct comparisons for their predictive utility for drink driving in a multivariate model. Therefore, the aim of the current study was to examine the associations between the individual factors and how they influence the self-reported likelihood of drink driving. It was hypothesised that a number of the individual factors would be associated with self-reported likelihood of drink driving. The second aim of this study was to examine the potential of attitudes mediating the relationship between risk-taking and self-reported likelihood of drink driving.

Method

Participants

The inclusion criteria required participants to be 18 years of age or older, to hold an Open Queensland drivers licence, and were currently driving on the Queensland road network. A total of 293 drivers participated in the study. A slightly higher proportion of participants were female (58.8%) and the participants ages ranged from 20-84 years ($M = 39.15$, $SD = 15.12$). The largest proportion of participants indicated they drive between 1-10 hours per week (61.2%), followed by 10-20 hours (33.0%).

Over half of the sample had completed a university degree, with 31.6% having completed an undergraduate degree and 27.1% having completed a postgraduate degree. The remaining participants had completed either secondary school, TAFE/technical college, or a trade apprenticeship. More than half of the sample was in full-time employment (57.4%). A small number of participants indicated they were currently not working (4.5%), with the remaining participants falling into the categories of studying (9.3%), casual employment (8.9%), part-time employment (10.3%), and self-employed (9.6%).

Materials

The online survey comprised of six sections (outlined in order of administration).

Personal characteristics

Personal characteristics were obtained from the participants including: demographic information (age, gender, education, employment status) and traffic-related demographic information (driver's licence status, number of hours spent driving and vehicle type).

Drink driving likelihood

Participants indicated their self-reported likelihood of drink driving in three contexts (when driving alone; with passengers; and in the late night/early morning hours) in the following month. These three items were measured on a 5-point Likert scale (1 = extremely unlikely to 5 = extremely likely). A scale score was created by averaging the items together.

Perceptions of law enforcement practices

The participant's perceptions of drink driving enforcement practices were measured by four items – participants were asked to indicate their agreement with statements on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The statements regarded the fairness of randomly breath testing drivers (e.g., “It is fair to enforce drink driving laws by randomly breath testing drivers”), targeting drivers who appear to be driving erratically, and breath testing all drivers in a crash (e.g., “It is fair to enforce drink driving laws by breath testing all drivers in a crash”). These statements were specifically developed for this study utilising similar wording devised by Poulter and McKenna (2007). The four items were averaged to create an overall score.

Personality constructs

The participant's personality constructs were measured by the International Personality Item Pool (IPIP; Goldberg 1992). The IPIP has a five factor model of personality that includes: extraversion, conscientiousness, agreeableness, emotional stability, and intellect/imagination. The five personality constructs are each measured by 10 items.

Participants responded to 50 items and indicated how accurately each item described them on a 5-point Likert scale (1 = very inaccurate, 3 = neither accurate nor inaccurate, 5 = very accurate). Examples of the items include: (I) “am the life of the party” (extraversion), “make a mess of things” (conscientiousness: reversed scored), “make people feel at ease” (agreeableness), “have frequent mood swings” (emotional stability: reversed scored), and “am quick to understand things” (intellect/imagination). The five personality constructs were created by summing scores of the items comprising each factor.

Attitudes towards drink driving

The participant’s attitudes towards drink driving were measured using the definitions component of Akers’ social learning theory (Akers, Krohn et al. 1979). Participants indicated their agreement to six statements (two positive, two neutral, and two negative) on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Examples items are: “people who drive when they think they might be over the legal alcohol limit are generally better drivers” (positive), “It’s okay to drive when you think you might be over the legal alcohol limit, as long as no one gets hurt” (neutral), and “there is no excuse for driving when you think you may be over the legal alcohol limit” (negative). The statements were custom written for this study and were consistent with guidelines from Akers (1990). An overall attitude score was created by reverse scoring the negative definition items before averaging the scores of all items.

Risk-taking driving

Risk-taking was assessed by Donovan’s (1993) risk-taking driving scale. Participants indicated their agreement to 8-items on a 4-point Likert Scale (1 = never, 4 = very often) that asks participants how often they would perform various risky driving behaviours. An example item is “While driving, how often do you take some risks because it feels good” –

none of the items assessed drink driving behaviours. Higher scores on the scale represented higher levels of risk-taking driving – an overall risk-taking scale score was created by averaging all the items.

Procedure

Advertisements about the study were used to recruit participants who were currently driving on Queensland roads. Distribution of advertisements was via university email lists and research participation web pages. The advertisements invited participants to complete a short online survey about driving and attitudes towards law enforcement. All participants that completed the survey were first presented with information about the study and then gave their informed consent electronically. The link to the survey was active for one month and participants using the same Internet Protocol address could not complete the survey more than once. Upon completion of the survey the participants could elect to enter a draw to win one of six \$50 fuel vouchers.

Statistical Analyses

The internal consistency of the scale scores were evaluated with Cronbach's alpha coefficient. A number of variables had non-normal distributions and non-parametric statistical analyses (Spearman's Rho correlation coefficients and logistic regressions) were used. The logistic regression required the outcome variable to have a dichotomous form. Thus, participants were divided into those that indicated they were extremely unlikely to drink drive (a score of 1 "extremely unlikely" on all self-reported likelihood of drink driving items) and those reporting some *likelihood* of drink driving (a score > 1 on at least one of the self-reported likelihood of drink driving items).

The potential of attitudes mediating the relationship between risk-taking and self-reported likelihood of drink driving was examined with the Baron and Kenny (1986) four

step method. A series of logistic regressions were used due to the skew of the variables to be used in the mediation analyses. To ensure equivalent comparisons between the coefficients (e.g., MacKinnon and Dwyer 1993) the risk-taking and attitudes variables were also transformed into dichotomous variables. For the risk-taking variables participants were divided into those that indicated no risk-taking propensity (a score of 1 “never” on all risk-taking items) and those reporting *some* risk-taking propensity (a score > 1 on at least one of the risk-taking items). Similarly, for the attitudes variable participants were divided into those that had negative attitudes towards drink driving (a score of 1 “strongly disagree” on all attitude items) and those reporting some *positive* agreement (a score > 1 on at least one of the attitudes items). Previous studies have used similar re-coding strategies, which have produced outcomes consistent with the extant literature (Baum 2000, Stoduto, Dill et al. 2008).

Results

Descriptive Statistics

Table 1 shows the means, standard deviations, and Cronbach’s alphas for the study variables. On average, participants were unlikely to drink drive. On the whole, the participants believed it was fair to enforce drink driving laws and similarly they did not hold positive attitudes towards drink driving. The risk-taking driving propensity was quite low.

Table 1.

Means, Standard Deviations, and Cronbach's alpha of the study scale scores.

Scale	<i>M</i>	<i>SD</i>	Cronbach's α	No. of items	Range
Self-reported likelihood of drink driving	1.30	0.62	.71	3	1-5
Extraversion	32.63	7.27	.88	10	10-50
Conscientiousness	33.66	5.30	.80	9 ^a	9-45
Agreeableness	40.39	5.23	.79	10	10-50
Emotional stability	33.68	7.17	.87	10	10-50
Intellect/imagination	37.59	5.09	.74	10	10-50
Risk-taking	1.20	0.36	.90	8	1-4
Attitudes	1.51	0.57	.75	6	1-5
Perceptions of legitimacy	4.49	0.52	.72	4	1-5

^a Data from one item on this scale was not recorded in the database owing to a technical error. Brief forms of the IPIP have been shown to have similar psychometric properties to the full length questionnaire (e.g., Donnellan, Oswald et al. 2006).

Re-coded variables

The variables that were re-coded into a dichotomous form can be seen in Table 2, along with the proportions of the participants that were in each group.

Table 2.

Proportions of participants likely to drink drive, have positive attitudes, and some risk-taking propensity with the re-coded variables.

Re-coded variables	Yes (%)	No (%)
Self-reported likelihood of drink driving (likely)	27.64	72.36
Attitudes (positive)	32.08	67.92
Risk-taking (some)	47.10	52.90

Bivariate analysis

Table 3 displays the bivariate correlations between the study variables. A number of predictor variables (age, conscientiousness, risk-taking, attitudes) were correlated with the dependent variable. Moderate correlations were found between the variables of risk-taking, attitudes, and self-reported likelihood of drink driving.

Table 3.

Bivariate correlations (Spearman's Rho) of the individual factors and their relationship with self-reported likelihood of drink driving.

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Drink driving	-										
2. Age	-.15*	-									
3. Gender (male) ^a	.11	.18**	-								
4. Extraversion	.05	-.28**	-.14*	-							
5. Conscientiousness	-.15*	.15*	-.06	.11	-						
6. Agreeableness	-.13*	-.04	-.38**	.38**	.20**	-					
7. Emotional stability	-.12*	.21**	.12*	.12*	.37**	.06	-				
8. Intellect/imagination	-.02	-.19**	-.04	.39**	.18**	.31**	.06	-			
9. Risk-taking	.31*	-.23**	.17**	.11	-.18**	-.13*	-.04	.06	-		
10. Attitudes	.36**	-.07	.10	-.07	-.21**	-.23**	-.11	-.14*	.23**	-	
11. Perceptions of legitimacy	-.10	.04	-.02	.08	.17**	.17**	.04	.07	-.16**	-.42**	-

** $p < .01$, * $p < .05$; ^a Point bi-serial correlations

Multivariate Analyses

An ordered logistic regression analysis was utilised to examine the associations between the individual factors and how they influence the self-reported likelihood of drink driving. Ordered logistic regression analyses are commonly used in road safety research and allows for non-modifiable factors to be added first (and controlled for) and then the modifiable factors are added. At the first step the demographic variables were entered; at step two the personality and risk-taking were entered; at the last step, the attitudes and perceptions of legitimacy variables were entered. Table 4 displays the steps of the logistic regression coefficients, Wald statistics, odds ratios (OR), and 95% confidence intervals for OR.

Table 4.

Logistic Regression table for self-reported likelihood of drink driving and study variables

	95% Confidence interval for OR					
Study variables	B	S.E.	Wald	OR	Lower	Upper
Step 1						
Age	-0.03	0.01	8.19	0.97*	0.96	.99
Gender(male)	0.50	0.27	33.9	1.66	0.97	2.83
Constant	-0.17	0.37	0.12	0.88		
Step 2						
Age	-0.02	0.01	2.47	0.98	0.96	1.01
Gender(male)	0.27	0.31	0.73	1.31	0.71	2.41
Extraversion	0.02	0.02	0.82	1.02	0.98	1.07
Conscientiousness	-0.04	0.03	1.94	0.96	0.91	1.02
Agreeableness	-0.04	0.03	1.39	0.96	0.91	1.03
Emotional stability	-0.02	0.02	0.69	0.98	0.94	1.02
Intellect/imagination	-0.02	0.03	0.39	0.98	0.93	1.04
Risk-taking	1.01	.38	7.01	2.75*	1.30	5.81
Constant	1.68	1.63	1.06	5.34		
Step 3						
Age	-0.02	0.01	2.60	0.98	0.96	1.01
Gender(male)	0.20	0.33	0.35	1.22	0.63	2.34
Extraversion	0.01	0.02	0.14	1.01	0.96	1.06
Conscientiousness	-0.02	0.03	0.43	0.98	0.92	1.04
Agreeableness	-0.01	0.03	0.06	0.99	0.93	1.06
Emotional stability	-0.01	0.02	0.32	0.99	0.95	1.03
Intellect/imagination	0.01	0.03	0.03	1.01	0.94	1.07
Risk-taking	0.68	0.39	2.95	1.97	0.91	4.25
Attitudes	1.48	0.31	22.85	4.38**	2.39	8.03
Perceptions of legitimacy	0.25	0.32	0.61	1.28	0.69	2.41
Constant	-3.71	2.45	2.83	0.03		

** $p < .01$, * $p < .05$

Age and gender were included in the first step of the logistic regression and were significant predictors of the outcome variable ($\chi^2(1, 2) = 10.44, p < .01$). The full model accounted for 5.08% of the variance for the likelihood of drink driving and correctly classified 72.16% of the participants. Age was a significant predictor of self-reported likelihood of drink driving ($OR = 0.97, p < .01$).

The second step included the addition of the personality variables (IPIP and risk-taking) and was a significant predictor of the outcome variable ($\chi^2(1, 8) = 34.76, p < .01$). An additional 6.68% of the variance (11.76% total) was accounted for; the classification accuracy of participants was similar (72.85%). With the inclusion of the personality

variables, risk-taking was now the only significant predictor of self-reported likelihood of drink driving ($OR = 2.75, p < .01$).

The third step included the addition of the attitudes and perceptions of legitimacy variable and was a significant predictor of the outcome variable ($\chi^2(1, 10) = 53.50, p < .001$). An additional 12.45% of the variance (24.21% total) was accounted for and the classification accuracy increased to 76.29%. At this last step of the logistic regression model, attitudes was the only significant predictor of self-reported likelihood of drink driving ($OR = 4.38, p < .001$).

Mediation Analyses

The second aim of this study was to examine the relationship between attitudes, risk-taking, and self-reported likelihood of drink driving. The first analysis revealed that risk-taking (predictor) was a significant predictor of self-reported likelihood of drink driving (outcome), $B = 1.19, SE = .28, p < .001$. Second analysis showed that risk-taking (predictor) was a significant predictor of attitudes (mediator), $B = 0.61, SE .24, p < .05$; attitudes was therefore identified as a potential mediator of the relationship between risk-taking and self-reported likelihood of drink driving. Last, the association of the mediator (attitudes) with the outcome variable (self-report likelihood of drink driving) while controlling for the association of the predictor variable (risk-taking) was a significant model ($\chi^2(1, 2) = 33.00, p < .001$) and accounted for 15.38% of the variance. Both the mediator (attitudes: $B = 1.19, SE = .35, p < .001$) and the predictor (risk-taking: $B = 1.08, SE = .28, p < .001$) were significant predictors of the outcome variable. The significance of the mediation was assessed via the indirect effects and attitudes significantly mediated the relationship between risk-taking and self-reported likelihood of drink driving ($Z = 1.98, p < .05$). Overall the mediation model was indicative of partial mediation, as the relationship between the attitudes and self-reported

likelihood of drink driving remained significant while accounting for the influence of the risk-taking. Figure 1 shows the resultant mediation model.

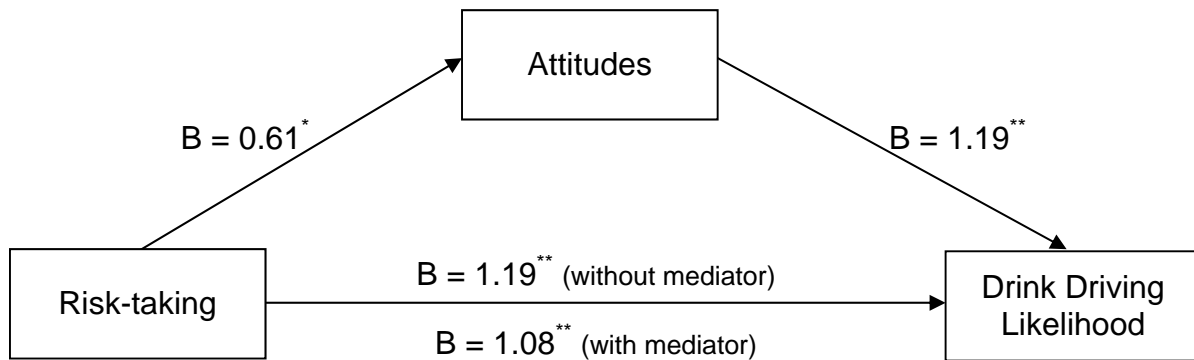


Figure 1. Mediation model of attitudes, risk-taking, and self-reported likelihood of drink driving.

** $p < .01$, * $p < .05$.

Discussion

The current study had two aims: first, to identify which individual factors (i.e., demographic, personality constructs, risk-taking, attitudes, and perceived legitimacy) were associated with self-reported likelihood of drink driving and second, to examine the relationship between risk-taking, attitudes, and self-reported likelihood of drink driving. When the individual factors were examined in an ordered logistic regression, age was a significant predictor, as was risk-taking. However, at the last step when the attitudes variable was entered into the model, attitudes was the only significant predictor of self-reported likelihood of drink driving. The second aim was to examine the potential of attitudes mediating the relationship between risk-taking and self-reported likelihood of drink driving. This mediation model was significant; however, attitudes only partially mediated the relationship between risk-taking and self-reported drink driving.

The Effect of Attitudes

Prior work has suggested that a number of individual factors were associated with drink driving likelihood. That is, demographic factors of age and gender (e.g., Doherty,

Andrey et al. 1998, Shults, Kresnow et al. 2009), attitudes (e.g., Baum 2000, Davey, Davey et al. 2005), perceived legitimacy (e.g., Watling and Leal 2012, Politis, Basbas et al. 2013), personality factors (e.g., McMillen, Adams et al. 1992, Fernandes, Job et al. 2007), and risk-taking (e.g., Horvath and Zuckerman 1993, Patil, Shope et al. 2006) have all been shown by previous work to be related to drink driving likelihood. As such, it was hypothesised that several of the identified individual factors would be related to self-reported likelihood of drink driving. At the bivariate level many, but not all of these individual factors were correlated with self-reported likelihood of drink driving.

The theoretical importance of the individual factors was revealed with the ordered logistic regression. At the first step, being a younger individual was significantly predictive of self-reported drink driving likelihood. The second step saw risk-taking being a significant predictor of the outcome variable; however, age was no longer a significant predictor. At the last step only attitudes was a significant predictor of self-reported likelihood of drink driving. A substantial amount of studies have highlighted the importance of attitudes influencing drink driving likelihood (Baum 2000, Davey, Davey et al. 2005, Freeman and Watson 2009, Politis, Basbas et al. 2013). However, many of these studies have not utilised an ordered regression method, such that the influence of each non-modifiable factor is controlled prior to the addition of the modifiable factors.

The current study contributes to the extant literature regarding the theoretical importance of attitudes over and above other individual factors for influencing self-reported likelihood of drink driving. An ordered logistic regression was utilised to examine the importance of the individual factors as they are entered into the logistic regression model, as well as controlling for the influence of variables entered at earlier steps. In the current study age was a significant predictor at step one; at step two only risk-taking was a significant predictor; and at step three only the attitudes variable was a significant predictor of drink

driving likelihood. While previous work has demonstrated that being a younger driver (Doherty, Andrey et al. 1998) and having a greater risk-taking propensity (Horvath and Zuckerman 1993, Patil, Shope et al. 2006) are related to drink driving likelihood, the current data suggests that attitudes towards drink driving are more salient for the facilitation of drink driving likelihood.

The practical utility of the obtained results are encouraging. That is, one of the two *modifiable* variables (attitudes) was the most important individual factor to influence drink driving likelihood. The continuation of educational campaigns aimed at modifying attitudes towards the acceptability and/or dangerousness of drink driving is supported, to a degree, from the obtained results. Especially, when considering that one third of participants in this study reported a positive attitude towards drink driving. Previous work suggests that drink driver's risk perceptions of the dangerousness of drinking and driving and crash likelihood when driving while intoxicated are unrealistic (Baum 2000) when the actual crash risk of drink driving is considered (e.g., Blomberg, Peck et al. 2005). It might be beneficial for educational campaigns to more comprehensively address the delivery of actual crash risk (Ivers, Senserrick et al. 2009).

It was found that the perceived legitimacy of enforcement of drink driving had no effect on the self-reported likelihood of drink driving. This was inconsistent with the scant literature exploring perceived legitimacy of traffic law enforcement. Specifically, previous work suggests that perceptions of legal sanctions can influence drink driving likelihood (Homel 1988, Freeman and Watson 2009). It is possible that the fairness of drink driving enforcement is of little consequence for the likelihood of drink driving. However, previous work has shown that the perceived fairness of sanctions and the perceived legitimacy of the sanctioning body can influence the committing of illegal behaviours (Tyler 1990, Sherman 1993, Watling and Freeman 2011).

It is also possible the perceived fairness of enforcement of drink driving is influenced by attitudes. This is one potential, as the largest bivariate correlation between study variables was between the perceived legitimacy and attitudes variables. However, it has been demonstrated that perceived legitimacy and attitudes, while moderately correlated are separate constructs and are both associated with illegal driving behaviours (Watling and Leal 2012, Watling, Soole et al. 2013). It is possible that the construct of perceived legitimacy is somewhat differently viewed by individuals than how it is empirically conceptualised. For instance, recent work by Watling and Armstrong (2013) has described the situation of ‘grey zone offending’, where driving when slightly over the legal BAC limit was perceived morally different than ‘actual’ drink driving. Therefore, the perceived legitimacy of drink driving enforcement may be theoretically different depending on the individual’s attitudes towards actually drinking and their subsequent driving behaviours. Future work could seek to examine these potential relationships between attitudes, perceived legitimacy, ‘grey zone offending’ and drink driving.

Risk-taking, Attitudes, and Drink Driving

The second aim of the study was to examine the specific relationship between risk-taking and self-reported likelihood of drink driving and whether attitudes mediated this relationship. Consistent with the extant literature risk-taking had significant relationships with self-reported likelihood of drink driving (Horvath and Zuckerman 1993, Patil, Shope et al. 2006) and with attitudes towards drink driving (Iversen 2004, Sarma, Carey et al. 2013). When the relationship between risk-taking and self-reported likelihood of drink driving, while controlling for attitudes, was examined a significant partial mediation model between risk-taking, attitudes, and self-reported likelihood of drink driving was established.

The current findings might prove informative with drink driving rehabilitation programs for apprehended drink drivers. Drink driving rehabilitation programs traditionally

seek to either modify the individual's alcohol consumption levels (Wells-Parker, Bangert-Drowns et al. 1995), to change drinking and driving behaviours (Mazurski, Withaneachi et al. 2011), or both (Sheehan, Fitts et al. 2012) and through this process of change, attitudes are typically modified. Programs that seek to modify drink and driving behaviours usually include information regarding the effects of alcohol on driving performance and the associated increased crash risk (Mazurski, Withaneachi et al. 2011). The risk-taking scale used in the current study was specific to driving behaviours and was significantly related to attitudes pertaining to drink drinking. As such, addressing risk-taking for other driving behaviours might prove beneficial for drink driving rehabilitation programs.

As a partial mediation model was established is it possible that other factors could enhance the mediation model (Baron and Kenny 1986). One factor that has the potential to be important for the mediation model is the influence from peers. A number of studies have found that peer influence has considerable effect on the likelihood of drink driving (Davey, Davey et al. 2005, Greenberg, Morral et al. 2005, Fernandes, Hatfield et al. 2010). The consumption of alcohol frequently occurs in social situations (Heath 1995) and social networks often maintain and encourage an individual's illegal behaviours when that is the groups normative behaviour (Hammersley 2008). Risk-taking propensity has also been found to be similar amongst peer group members (Møller and Gregersen 2008). Considered together, the influence from peers could be an important aspect for the likelihood of drink driving.

There are some limitations of this study that need to be taken into account when interpreting the findings. The outcome variable in this study was a self-report measure and leaves it susceptible to self-reporting bias and may not reflect the participants' true behaviours. Self-report data can be influenced by the effects of social desirability which is especially true when assessing data of a sensitive nature, such as drink driving. However, as

many participants in this study were willing to report risky attitudes and behaviours, social desirability bias may not have been a significant problem in this study. Moreover, the current study utilised an online questionnaire where participant anonymity was assured, with prior research suggesting the effect of social desirability is diminished when the data is collected in private environments versus public environments (Lajunen and Summala 2003, Sullman and Taylor 2010). Moreover, previous work suggests that the relationship between self-reported likelihood to drink drive and actual drinking and driving behaviour ranges between $r = .79$ and $.83$ (Green 1989, Kim and Hunter 1993). The recruitment of participants utilised a convenience sample method and as such, self-selection bias might have occurred.

Additionally, the sample was not representative of all Queensland drivers and limits the generalisability of the results. Nonetheless, previous work that has examined risky driving behaviours and has reported similar limitations have demonstrated results that were consistent with the extant literature (e.g., Fleiter and Watson 2006, Hatfield and Fernandes 2009, Watling, Palk et al. 2010). Last, the participant's alcohol consumption levels were not measured; higher levels of alcohol consumption are associated with greater drink driving likelihood (Greenberg, Morral et al. 2005).

Given the relationship found between risk-taking, attitudes, and drink driving likelihood, further research could examine how risk perceptions of drink driving are associated with attitudes and risk-taking. Depending of the results this could prove to be useful for educational campaigns as risk perceptions are modifiable. Future studies could also look at examining the current paradigm with an offender sample, as previous work has found notable difference between offender and non-offender samples (e.g., Baum 2000, Hubicka, Källmén et al. 2010). Different aspects of perceived legitimacy (i.e., enforcement practises, the sanctioning body, legal sanctions) as well as the influence of 'grey zone offending' could be more closely examined for their associations with drink driving likelihood.

Conclusion

Crashes that are primarily due to the driver having an excessive BAC level still account for a significant proportion of crash incidents that occur on Australian roads. Considerable effort has been devoted to reducing drink driving on the road network. Yet, as demonstrated in the current study, some participants still have positive attitudes towards drink driving and reported that they were likely to drink drive in the future. The current results found that being a younger driver and having a high risk-taking propensity were related to self-reported likelihood of drink driving. However, when the attitudes variable was considered, these individual factors were no longer significant; with attitudes being the most important predictor of self-reported drink driving likelihood. These findings suggest that more work is needed to address attitudes regarding the dangerousness of drink driving to reduce drink driving prevalence rates and make the road network safer for all individuals who use it.

Acknowledgements

The assistance of Nathan Dovan and Gabrielle Stephenson in survey development and data collection is gratefully acknowledged.

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